PROJECT NUMBER: 2501
PROJECT TITLE: Smoke Chemistry
PROJECT LEADER: R. Comes
PERIOD COVERED: July, 1988

I. SIDESTREAM SMOKE

A. Objective: Conduct studies on sidestream smoke including: development of methods for collection and analysis of sidestream gas phase and semivolatiles; visibility determinations; analysis of selected materials relating to modification of sidestream odor and irritation; development of potential proprietary products.

B. Status: (1) Development continues on methods of analysis of sidestream gas phase. Materials are on order for construction of a gas phase sampling apparatus for quantitatively trapping an aliquot of sidestream gas phase. (2) Method development is underway to sample larger amounts of the semivolatile fraction of sidestream smoke so that compounds present at lower levels can be detected. (3) Visibility measurements of sidestream smoke continue on selected models. (4) Joint efforts continue on studies relating to the odor and irritation of sidestream smoke. (5) Local approval of the "650" for construction of the sidestream smoking chamber has been obtained.

C. Results: (1) Various adsorbents have been used in conjunction with the Tekmar desorber to attempt optimization of collection of sidestream gas phase components. These include Tenax, Carbopack (graphitized carbon black), Carbosieve (carbon black on molecular sieve) and combinations of the above. Collection, desorption and chromatographic conditions have been altered to facilitate the analysis. (2) Ether has been investigated as a solvent for concentration of some trace materials in the semivolatile fraction. (3) A comparative study of sidestream visibility and TPM was carried out on the single port, 17-port and 5-port CORESTA smoking machines. Although, as expected, different "numbers" were obtained, the rank order of the samples was the same. A 5-port smoking machine has been modified to incorporate the best features of the single and 17-port machines and has been transferred to Development for use as the standard machine for future visibility determinations. An 8-port smoking machine has been purchased from Filtrona. (4) Joint studies continue with new samples to investigate their potential effect on sidestream odor and irritation. Methods for analytical detection and quantitation are being evaluated.

D. Plans: (1) Continue work on gas phase method development, analytical precision, compound identifications and comparison of gas phase from low sidestream models. (2) Better methods to concentrate volatiles in the semivolatile fraction will be investigated. A sniffing port will be built for evaluation of samples produced from this smoke fraction. (3) Conduct repetitive smokings on the modified 5-port smoking machine to insure its utility as the visibility apparatus of choice. Modify the new 8-port apparatus to test its future use as a visibility apparatus. Conduct visibility determinations as required. (4) Continue support efforts to develop

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analytical methodology to analyze sidestream smoke samples from an odor and irritation standpoint. (5) Initiate construction and instrumentation purchase upon receipt of final "650" approval for the sidestream smoking chamber.

II. MISCELLANEOUS

A. Final approval has been given and components have been received for construction of a new total recovery smoking machine. This machine will be used for future ^{14}C-studies.

B. A collaborative effort is underway in support of Project ART. A sample of tobacco, previously treated by the ART process, was extracted and the neutral fraction collected. Component identifications in this fraction are being conducted.

C. Routine GC/MS and pyrolysis/GC/MS analyses are being carried out as requested.

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